When the crystals are placed in an atmosphere of chlorine they at once liquefy, and the liquid becomes hot. The products are carbon tetrachloride and liquid chloride of iodine, ICl, which latter gradually volatilizes away in the form of the chloride, ICl_3.

$$CI_4 + 4Cl_2 = CCl_4 + 4ICl.$$

When heated gently in dry oxygen, it becomes decomposed into iodine and carbon, which latter burns away to carbon dioxide upon slightly raising the temperature. Melted sulphur reacts with carbon tetra-iodide with considerable violence; vapour of iodine is evolved, carbon deposited, and iodide of sulphur formed. If, however, powdered sulphur is warmed with carbon tetra-iodide to 50°, iodide of sulphur and carbon bisulphide are produced. Phosphorus acts with great energy upon it, forming compounds which are still undergoing investigation. Sodium and potassium react with incandescence, an alkaline iodide and free carbon being produced. Mercury and silver likewise attack it at the ordinary temperature, and very rapidly upon warming. Warm hydrochloric and hydriodic acids attack the crystals rapidly, with formation of iodoform and liberation of vapour of iodine. A particularly interesting reaction is that with fluoride of silver. When a quantity of this salt is placed in a solution of carbon tetra-iodide in carbon tetrachloride warmed to 50°, a regular evolution of gaseous carbon tetrafluoride occurs.

$$CI_4 + 4AgF = CF_4 + 4AgI.$$

This reaction affords the readiest means yet discovered of preparing carbon tetrafluoride.

THE additions to the Zoological Society's Gardens during the past week include a Vervet Monkey (*Cercopithecus lalandii* ♀) from South Africa, presented by Mr. J. Parr; a Bonnet Monkey (*Macacus sinicus* ♂) from India, presented by the Rev. W. P. Beckett; a Black-faced Kangaroo (*Macropus melanops* ♀) from Australia, presented by Mr. P. Clark; two Red-crested Finches (*Coryphosphingus cristatus*) from South America, presented by Commander W. M. Latham, R.N., F.Z.S.

OUR ASTRONOMICAL COLUMN.

THE SECULAR VARIATION OF LATITUDES.—The *American Journal of Science* for December contains a paper on secular variations of latitudes, read by Prof. George C. Comstock at the Washington meeting of the American Association for the Advancement of Science. The determinations of the latitude of Greenwich made from the time of Flamsteed (1693) to now—that is, over a period of very nearly two centuries—indicate a very appreciable progressive diminution. But as the observations were made with five different instruments, and are affected, to an uncertain extent, by various sources of error, no definite conclusion can be drawn from them. In the cases of the latitudes of Pulkowa, Königsberg, Washington, and Madison, however, Prof. Comstock thinks there is definite evidence of a change of latitude, and from an examination of numerous absolute observations, and a reduction of recorded star-places, he arrives at the data contained in the following table:—

Station.	Longitude (from Greenwich).	Annual Variation of Latitude.	Computed Annual Variation.
	°	″	″
Pulkowa ...	30·3 E. ...	− 0·006 ...	− 0·007
Königsberg ...	20·5 E. ...	− 0·003 ...	− 0·000
Washington	77·0 W. ...	+ 0·042 ...	+ 0·044
Madison ...	89·4 W. ...	+ 0·043 ...	+ 0·041

A least square solution of the observed data was made to determine the most probable direction and amount of motion of the Pole. The result was 0″·044 along the meridian 69° W. of Greenwich. The values contained in the last column of the above table were computed from these elements. For the systematic investigation of the motion of the Pole it is suggested that two stations in about the same latitude, but having longitudes about 70° W. and 110° E. respectively, should have their latitudes simultaneously determined by zenith telescope observations of the same pairs of stars. "An annual motion of the Pole of 0″·045 will alter the difference of latitude of these stations by twice this amount per year, giving a change in the difference of latitude amounting to 1″ in eleven years—a quantity which cannot possibly escape careful observation with the zenith telescope or prime vertical transit. If similar observations be made 20° east of Greenwich, they will furnish the best obtainable data for determining the direction of motion of the Pole." All sources of systematic error can be eliminated by the adoption of such a method, and our knowledge of secular variations of latitude, as important to the geologist as to the astronomer, will be of a more definite character than at present.

THE ROTATION OF VENUS.—Herr Löschardt sends us a paper on Schiaparelli's hypothesis as to the period of rotation of Venus, presented by him to the Vienna Academy of Sciences on March 12, 1891. He criticizes the conclusions drawn by Schiaparelli from observations made by others and himself, and points out that the observations made by Denning in 1881 favour the old rotation period of 23d. 21m. rather than one of 224 days. Herr Löschardt has made a number of drawings of the markings on the planet shown by his 3-inch refractor at Nákófalva, and the discussion of them gives support, on the whole, to Cassini's value of the rotation period. The chief reasons which led to this conclusion are the differences between Perrotin's observations and those made at Nákófalva at different hours in the same day, the circular form of polar patches, and the ellipsoidal distribution of the atmosphere, which is said to be the result of swift rotation.

STARS HAVING PECULIAR SPECTRA.—In a communication to *Astronomische Nachrichten*, No. 3070, Prof. Pickering records that the three stars tabulated below show bright lines in their photographic spectra, and belong to the same class as the stars discovered by Wolf and Rayet:—

Designation.	R.A. 1900.	Decl.	Galactic latitude.	Galactic longitude.
	h. m.	° ′	° ′	° ′
D.M. + 55°·2721 ...	22 15·0 ...	55 37 ...	−0 50 ..	70 29
— ...	22 23·7 ...	55 46 ...	−1 20 ...	71 38
D.M. + 56·2818 ...	22 32·9 ...	56 23 ...	−1 25 ...	73 3

It will be seen that these stars, like the 35 others of the same class, fall near the central line of the Milky Way.

THE TOWER OF BABEL AND THE CONFUSION OF TONGUES.[1]

WHO among the readers of ancient history has not pictured to himself great Babylon, with its long straight streets at right angles, its quays along the banks of the Euphrates, its royal palaces, its double walls, and last, not least, its towers in stages, dedicated to the various gods? The picture of grandeur is one of which we can form an estimate only, but it must have been magnificent beyond what was customary in those days, for had not the great Nebuchadnezzar built it? He describes at great length what he had done for the city, for its walls, for its streets, its temples, its towers, and its palaces.

But there was a time when Babylon was not the great city. At first a village settlement, it gradually arose to be the capital of a powerful State, a progress that probably occupied 4000 years, not including the pre-historical period. The story of the beginnings of this great city, which are lost in antiquity, is told in Genesis, and forms one of the most charming of the legends of the Bible. The Biblical account is given in the genealogical table just before "the generations of Shem," and seems to be an interpolation to explain the numerous languages of the world. What the source of the legend may be is uncertain, but as a whole it is unique, for though its source is possibly Babylonian, nothing like it has yet come from that country or from Assyria. The so-called Babylonian legend of the Tower of Babel seems to have nothing to do with the Biblical one—indeed, the evidence all points to its referring to something entirely different.

"As they journeyed (so the Bible narrative says) in the East, they found a plain in the land of Shinar." This land of Shinar is generally regarded as the Sumer of the Babylonian and Assyrian inscriptions. The Sumerians and Akkadians were of a different stock from the Semitic inhabitants of the country, and

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[1] Abstract of a Lecture by Theo. G. Pinches, before the London Institution, December 3, 1891.

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spoke two entirely different dialects, making, with the Kassite, the Semitic Babylonian, the Aramaic, and the Chaldee, no less than six dialects and languages; and, as if this Babel were not enough, the tones of Elamites and other foreigners might also be heard. It will probably be admitted that the confusion of tongues which this gathering of nations made at Babylon was striking enough to the visitor in whose native land one language only prevailed.

The indications point to the fact that the Akkadians were the invaders in Babylonia, and they gave a great many kings to the land. It was a state of things not unlike the heptarchy in Old England—a number of small States fighting amongst themselves, the most powerful gradually absorbing the weaker, until, about the time of the great Hammu-rabi, about 2220 B.C., the whole became united; after which date probably only the wild Chaldæan tribes remained practically independent, under their native chiefs, and afterwards gave kings to Babylonia itself.

The Semitic Babylonians of Mesopotamia were probably rather short and thick-set, though there must have been a great many people of normal height and even tall stature among them. They were dark and heavily bearded, but during the time of the Akkadian supremacy they seem to have shaved, like their rulers. The Akkadians seem to have had noble and dignified features, and their figures, as shown on the engraved and sculptured stones, were far from inelegant. There was also, apparently, a type of Akkadian with a curved prominent nose and a retreating forehead, something like the Elamites shown on the Assyrian bas-reliefs. [Several examples of the various types were shown.]

These people, journeying "in the East," resolved to build a city "and a tower"; and this tower, which the inhabitants of Shinar decided to build, was quite a special thing of their own. Every city in ancient Babylonia had a tower, some more than one, and they were of varying forms. The Semitic Babylonians seem to have called their memorial towers *zikkurāti*, a name which was even applied (as in the Babylonian account of the Flood) to natural eminences of a similar form. The Akkadians appear to have called them "watch-towers." They were intended (according to Perrot and Chipiez) to give that picturesque element to the land which accidents of Nature usually give to other countries more favoured, and also to astonish the contemporary traveller, as well as that posterity for whom no more than a heap of shapeless ruins would remain. However that may be, they certainly served in their time a practical purpose—namely, for religious ceremonies, and for astrological and astronomical observations. There were twenty-two principal erections of this kind in the earliest period in Babylonia, according to one of the lists.

Descriptions and illustrations were now given of the different forms of towers in Babylonia, and it was pointed out that Nebuchadnezzar mentioned a "Tower of Babel" (*zikurat Babilam*) which he "made anew," and "raised its head with burnt brick and bright lapis"; but he did not devote many words to it—why, is not known, unless it be that some ill omen was attached to it. This "Tower of Babel" of Nebuchadnezzar is not the Birs-Nimroud, and for that reason, as well as because the latter did not lie within Babylon, we may doubt whether it be the Biblical "Tower of Babel," as has been, and still is, supposed.

It is difficult now to imagine the place where the great confusion of tongues existed as the site of a great city, with its teeming life. The place where Babylon stood is now a series of mounds more or less shapeless, and masses of brickwork, but otherwise a marsh. The "great city," "the beauty of the Chaldees' excellency," has "become heaps." The ruins of the palace of Nebuchadnezzar, and of the temple-tower of Babil, are among the more prominent remains.

After a sketch of the life of the city of Babylon in ancient times and the religious festivals and ceremonies, and how the temple-towers and the services remained after the cities had decayed and practically vanished, the lecturer recited a translation of the hymn to the setting sun sung by the priests of Ê-zida, the supposed Tower of Babel—

Hymn to the Setting Sun, chanted by the Priests of Ê-zida.

"Sun-god, in the midst of heaven,
At thy setting,
May the latch of the glorious heavens
Speak thee peace;
May heaven's door to thee be gracious;
May the Director, thy beloved messenger, direct thee.
At Ê-bara, the seat of thy lordship,
Show forth thy supremacy.
May Aa, thy beloved wife,
Gladly go to meet thee.
May thy heart take rest,
May the property of thy godhood
Be confirmed to thee.
Warrior, hero, Sun-god, may they glorify thee!

Lord of Ê-bara, may the road of thy path be prosperous—
Sun-god, cause thy highway to prosper,
Going the everlasting road to thy rest.
Sun-god, thou art he who is the judge of the land,
Causing her decisions to be prosperous."

The priests' morning hymn began:—

"Sun-god, in the glorious heavens rising,"

and the lecturer pictured the day when the priests who chanted these hymns were there no more, and the faith which had raised Babylon's splendid temples and noble towers was, at last, as dead as her departed glories, to become the heritage of the student and of those who love to hear the ever-charming story of the romanceful East.

A YEAR'S SCIENTIFIC WORK IN NEW GUINEA.

A RECENT administration report from New Guinea, issued by the Colonial Office, contains an appendix on the scientific work of the year in the island. The first paper in this is a report by Baron von Mueller on the botanical specimens collected He says that the increase in our knowledge of the Papuan flora, derived from Sir William MacGregor's collection in 1890, has been again important. Foremost as a result we learn from these contributions that a considerable number of Australian species of plants, which, as such, were hitherto regarded as quite endemic, are likewise indigenous to the vicinity of the Mai-Kussa and Wasi-Kussa in New Guinea. Thus they occur precisely opposite to Cape York, from whence the seeds may have been carried across by migratory birds or perhaps by some other agencies. These, otherwise only Australian, plants may therefore not really belong to the primitive vegetation of New Guinea, though they are now established in such a way as not to admit of distinguishing them in regard to their origin from the great bulk of the lowland species, whether truly Papuan or simultaneously also Malayan. The occurrence has already been demonstrated of a number of lowland plants of specific Australian type in various parts of New Guinea. To these can now be added a number of others which are specified by Baron von Mueller. It can now be shown also that the cedar (or rather cedrel), of which many shipments have been made to Australian ports, is identical with the Singapore cedar (*Cedrela Toona*). The magnificent and renowned aquatic plant, *Nelumbo nucifera*, has now been located on the upper Fly River. Some other plants, unknown from New Guinea before, such as *Polygala chinensis*, *Salomonia oblongifolia*, *Sesuvium Portulacastrum*, *Leptospermum Javanicum*, and *Limnophila gratioloides*, are recorded in the Administrator's last collection, while some more are awaiting careful comparative elucidation before the fixing of their systematic position. Count Solms-Laubach, the monographer of Pandaneæ, has acknowledged the screw pine from Ferguson Island, in the Louisiades, as a new species under the name *P. Macgregorii*. An essay of Baron von Mueller on the highland plants collected during the year by Sir William MacGregor has appeared in the publications of the Royal Society of Victoria. But he was able to examine only a few of the ferns brought from the upper region of the Owen Stanley Range; among them, however, is the new *Cyathea Macgregorii*, which reaches a higher elevation than any other of the many kinds of fern-trees now known. To expedite the determination of their specific position, Mr. Baker, of Kew, has undertaken to define systematically the seventy species of *Ficilis* and *Lycopodiaceæ*, contained in Sir William MacGregor's collection from the Owen Stanley Ranges. Mr. Baker regards nineteen of these ferns as new, and therefore, so far as our present experience reaches, as exclusively Papuan. These hitherto unknown species are comprised within the genera *Cyathea*, *Hymenophyllum*, *Dicksonia*, *Davallia*, *Lindsaya*, *Aspidium*, and largely *Polypodium*. The Curator of the Queensland Museum reports on the zoological collections. No new animal of the warm-blooded class has been met with during the year;

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